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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,419	01/11/2006	Oscar Hendrikus Willemsen	NL030827	8964
24737 7590 08/29/2007 PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510			EXAMINER DOAK, JENNIFER L	
			ART UNIT 2872	PAPER NUMBER
			MAIL DATE 08/29/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/564,419

Applicant(s)

WILLEMSSEN ET AL.

Examiner

Jennifer L. Doak

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-6, 10, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Neukermans et al. (US 5,629,790).**

#### INDEPENDENT CLAIM

Regarding Claim 1, Neukermans et al. teaches a two dimensional scanning device (Figs. 12a and 12b), for use in a projecting display (Abstr.), comprising a surface (207) suspended by at least two torsion elements (209) defining a torsion axis, and a first actuator (col. 10, lines 12-53) for pivoting the surface (207) around the torsion axis (Fig. 12a – seen passing through the x-axis through elements (209)), characterized by a cantilever beam ((203), (205), and (207)) having one end fixed in relation to the surface and an opposite end arranged to bend around a bending axis non-parallel to the torsion axis (Fig. 12a – seen passing through the x-axis through elements (209)), a reflective surface (203) provided on the cantilever beam ((203), (205), and (207)), and a second actuator (col. 10, lines 12-53) for bringing the cantilever beam ((203), (205), and (207)), to oscillate at its resonance frequency (col. 10, lines 12-53; col. 11, lines 35-62).

#### DEPENDENT CLAIMS

Neukermans et al. teaches, as discussed above, all the elements of Claim 1, upon which the following claims depend.

Regarding Claims 2 and 12, Neukermans et al. further teaches that a cantilever beam ((203), (205), and (207)), has such mass and such dimensions that its resonance frequency is in the range of 10 kHz-100 kHz (of claim 2) and a range of 15-35 kHz (of claim 12). Neukermans teaches a frequency of 20 kHz (col. 10, lines 12-53). It is inherent, according to Hooke's Law, that the mass and dimension must accommodate the named frequency.

Regarding Claim 3, Neukermans et al. further teaches that the cantilever beam ((203), (205), and (207)), has such dimensions that it is bendable around the bending axis in a range of at least 15 degrees. Neukermans et al. teaches "several degrees to tens of degrees" (col. 1, lines 9-17). "Tens of degrees" is plural and thus means at least two times ten, thus twenty, which exceeds the at least 15 degrees claimed.

Regarding Claim 4, Neukermans et al. further teaches in Fig. 12a that the cantilever beam ((203), (205), and (207)), has two legs (205), each being fixed in relation to the surface (207), and wherein the reflective surface (203) extends to unite the two legs (205).

Regarding Claim 5, Neukermans et al. further teaches in Fig. 12a that the cantilever beam ((203), (205), and (207)) and the surface (207) are formed from one substrate (col. 1, lines 22-48), the cantilever beam ((203), (205), and (207)) extending from one side of an opening in the surface (207).

Regarding Claim 6, Neukermans et al. further teaches that the surface (207) and the torsion bars (209) are formed by etching a substrate of silicon (col. 1, lines 22-48) or silicon nitride. Moreover, the further limitations of claim 6 are directed to method steps of making the device. The method limitations are not germane to patentability pursuant to MPEP §2112.02, since it has been held that "[E]ven though product-by-process claims are limited by and defined

Art Unit: 2872

by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.’ *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).”

Regarding Claim 10, Neukermans et al. teaches a two dimensional scanning device (Figs. 12a and 12b), for use in a projecting display (Abstr.), comprising a surface (207) suspended by at least two torsion elements (209) defining a torsion axis, and a first actuator (col. 10, lines 12-53) for pivoting the surface (207) around the torsion axis (Fig. 12a – seen passing through the x-axis through elements (209)), characterized by a cantilever beam ((203), (205), and (207)) having one end fixed in relation to the surface and an opposite end arranged to bend around a bending axis non-parallel to the torsion axis (Fig. 12a – seen passing through the x-axis through elements (209)), a reflective surface (203) provided on the cantilever beam ((203), (205), and (207)), and a second actuator (col. 10, lines 12-53) for bringing the cantilever beam ((203), (205), and (207)), to oscillate at its resonance frequency (col. 10, lines 12-53; col. 11, lines 35-62). Neukermans et al. further teach a projecting device (the “television” referenced in Abst.).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neukermans et al. (US 5,629,790).**

Regarding Claim 7, Neukermans et al. teach, as discussed above, all the elements of Claim 1, upon which this claim depends. Neukermans et al. teach the use of electrostatic actuators (Fig. 2b:(223)). Neukermans et al. fail to teach that the second actuator is a piezo-electric actuator. However, it is well known in the art that piezo-electric actuators are common actuators to use in micro-machined scanning mirror systems. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to use a piezo-electric actuator in place of an electrostatic actuator, because a piezo-electric actuator provides for precision of the oscillation. Moreover, they are art-recognized equivalents.

Regarding Claim 13, Neukermans et al. further teaches that the cantilever beam ((203), (205), and (207)), has such dimensions that it is bendable around the bending axis in a range of at more than 50 degrees. Neukermans et al. teaches "several degrees to tens of degrees" (col. 1, lines 9-17). "Tens of degrees" is plural and thus means at least two times ten, thus twenty, but could be any value up to 90. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow for a greater than 50 degree angle so as to allow a wider scanning angle so the target could be closer and the system smaller.

**Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neukermans et al. (US 5,629,790) in view of Bard et al. (US 5,486,944).**

Regarding Claims 8 and 9, Neukermans et al. teach, as discussed above, all the elements of Claim 1, upon which these claims depend. Neukermans et al. fail to explicitly teach that the first actuator is a galvanic actuator, comprising an electromagnet or that the first actuating means

Art Unit: 2872

comprises two electrically conducting coils. Neukermans et al. and Bard are related art, since they are both bi-directional scanning devices. Bard does teach that that the first actuator is a galvanic actuator, comprising an electromagnet (Abstr.) or that the first actuating means comprises two electrically conducting coils (Abstr.). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify Neukermans et al., they are art-recognized equivalents to include a first galvanic actuator, since electromagnets and conducting coils are known to drive wide range motion.

**Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neukermans et al. (US 5,629,790) in view of Conemac (US 6,226,126).**

Regarding Claim 11, Neukermans et al. teach, as discussed above, all the elements of Claim 10, including the scanner of Claim 1. Neukermans et al. fail to teach that the projecting device, further comprises means for generating a plurality of laser beams, a driver for modulating the laser beams, and means for collimating and combining the beams, and directing the combined beam onto the scanner. Neukermans et al. and Conemac are related art since both center on bi-dimensional scanning devices. Conemac teaches that projecting device that comprises means for generating a plurality of laser beams (col. 8, lines 31-45), a driver for modulating the laser beams (col. 8, lines 31-45), and means for collimating and combining the beams, and directing the combined beam onto a scanner (col. 1, lines 14-43; col. 2, lines 37-55; and col. 9, lines 6-36). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify Neukermans et al. to include the laser beam generation and driver of Conemac, in order to provide scanning precision and accurate direction

of the scanning beam. Further, the modified projection device including the scanning system would provide for a higher principal vibration frequency and reduced breakage.

***Response to Arguments***

Applicant's arguments filed 7/17/07 have been fully considered but they are not persuasive.

Applicant argues that cited elements (203), (205), and (207) cannot together be a cantilever beam since a torsion bar is not a cantilever beam because a cantilever beam has a bending axis perpendicular to its lengthwise extension based on Figs. 2-3 of the present application; that, even if these elements were a cantilever beam, they rotate in the wrong direction: parallel to their length rather than perpendicular, and this results in a one-dimensional scanner rather than 2-dimensional scanner.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the feature upon which applicant relies (i.e., "a cantilever beam") has been given its broadest reasonable interpretation. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The examiner respectfully disagrees with applicant's interpretation that the cited elements (203, 205, and 207) do not together constitute a cantilever beam. "Torsion bars" and "cantilever beams" are art-recognized equivalents, and these elements are integral together, formed of the same piece of silicon (Neukermans, col. 1, lns. 23-48). Moreover, the claim language defines two axes: A and B, and it is these axes within the system, not with respect to a single element, such that the rotation axes of Neukermans Fig. 12a: 215 and 216 are found to read on the claim language.



It is apparent that Neukermans is an x-y scanner. The claim defines a cantilever beam as having one end fixed in relation fixed in relation to said surface and an opposite end arranged to bend around a bending axis (A) non-parallel to torsion axis (B). In Neukermans torsion axis (B) can be read as the x-axis through elements 209. The cantilever beam of Neukermans has one end fixed to the surface (i.e., the joining of elements 205 and 207), and the opposite end arranged to bend around the y-axis (i.e., 205 rotates along the y-axis (axis A), which is perpendicular to x-axis (axis-B)). Neukermans element 203, joins the two 205 elements into one single piece, or cantilever. Examiner's inclusion of element 207 is directed to claim language defining the cantilever as attached to the fixed surface, which is shown in Fig. 12a.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Weimer et al. (US 6863832) and Jung (US 5877517) are cited as similar MEMS devices.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 2872

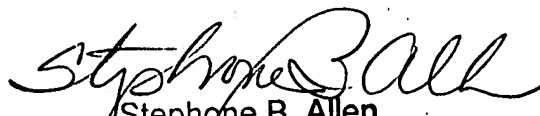
however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Doak whose telephone number is 571-272-9791. The examiner can normally be reached on Mon-Thur: 7:30A-5:00P, Alt Fri: 7:30A-4:00P (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JD  
8/24/07

  
Stephone B. Allen  
Supervisory Patent Examiner